



## Using the health belief model regarding HIV/AIDS prevention among female high school students

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### Abstract

This study aimed to design and evaluate the effects of an educational program based on health belief model on beliefs of high school female students. Participants from 9<sup>th</sup>, 10<sup>th</sup> and 11<sup>th</sup> grades including 77 students from intervention school and 72 students from control school were assessed. The intervention group were received a 90-minute educational session based on the model. Data were collected through a valid self administered questionnaire at initial of the study and two months after intervention. The mean ages of intervention and control group were as 15.49±0.91 and 15.65±0.99 respectively. The two groups were the same at the beginning of the study in terms of all variables except for fathers' education, mothers' education and mothers' occupation. After intervention the mean score of knowledge in intervention group (12.9±1.33) was significantly better than control group (10.6±1.85). Furthermore, at 2- month follow up, the mean scores of other constructs including perceived susceptibility (21.7±4.29), perceived severity (25.48±5.46), perceived benefit (22.18±2.9), perceived barrier (20.12±3.16) and perceived self efficacy (21.87 ±3.61) were significantly better than these constructs in control group. The educational program improved beliefs of the students regarding HIV/AIDS preventive behaviors.

**Keywords:** Health Belief Model, Health Education, HIV/AIDS, Prevention, Student

### Introduction

Since the beginning of the Human Immunodeficiency Virus, acquired immune deficiency syndrome (HIV/AIDS) epidemic in Iran up to May 2013, approximately 26556 individuals including 23784 male and 2772 female were infected with HIV and 4796 individuals including 4076 male and 720 female were suffering from AIDS. Based on this report that was disseminated by ministry of health of Iran, about 96.8% of individuals

suffering from HIV/AIDS were infected with HIV through injections [1].

Existed evidences indicated that the prevalence of AIDS in Iran has being increased recently and will be growing in future years. It has been argued that the statistics regarding transmission of HIV through sexual conduct in Iran has rendered unreliable<sup>6</sup>. However, there is much concern that the third wave of HIV transmission in Iran may be changing towards a trend of

increased sexual intercourse transmission [2]. Advances in HIV care have been resulted in prolonged life expectancy for HIV positive patients, which subsequently caused increased new infected persons rather than mortality rate due to HIV disease [2]. In previous study which was done in Iran, the participants indicated they had no enough knowledge and accurate beliefs regarding HIV/AIDS disease that could be predictors of HIV infection [2].

According to World Health Organization (WHO) reports, education was the most important way to prevent increasing HIV infection, in which high risk groups such as female adolescents should be paid more attention [3].

One of the preventive models that could be set in HIV prevention was Health Belief Model. This model was originally invented by social psychologists in the 1950s to predict the factors affecting on preventive health behaviors [4]. The constructs of this mode describe people would prevent unhealthy behaviors to the disease and believe that the disease would resulted in severe consequences. Also this model argued that if individuals believe that a preventive behavior would be useful in reducing the

Risk of disease, and the available barrier to a healthy behavior are less important than its benefits, they would perform the behavior [4].

Furthermore, it has been evidenced that an important cause for increasing rate of HIV/AIDS among youth in Iran, was low perception and wrong beliefs of HIV/AIDS' transmission [2]. Since there was limited evidence regarding perception of female high school studying in Tehran and - on other hand- HIV/AIDS transmission happens through behavioral process, behavioral change interventions were the essential approach to control this infection. This study aimed to design and evaluate the health education program based on health belief model to change HIV/AIDS prevention beliefs among high school students in Tehran, Iran.

### Method

This study was conducted from Sep 2013 to Dec 2013 in order to evaluate the effectiveness of a designed educational program on

knowledge and level of perception towards HIV prevention based on HBM among high school students in Tehran, Iran. A two-stage cluster sampling method was used to select the study participants. At first stage, two school from all ones of number 8 division of education ministry were randomly selected and divided randomly to intervention or control school. Then all students of both schools who were studying in grade 9, 10 and 11 were recruited if they were satisfied to taking part in the study. The selected participants were provided with self-administered questionnaire by which data were gathered. The items of questionnaire were selected through literature review based on HBM. The questionnaire used in previous study was applied in present study [5]. To approve the content validity of the questionnaire some health education specialists assessed the items, their wording and scaling indices to obtain qualitative validity. Moreover, the Content Validity Ratio (CVR) and the Content Validity Index (CVI) were used to determine quantitative validity of the questionnaire. The necessity of an item was addressed by a 3-point rating scale of being essential, being useful but not essential, and being unessential in order to assess CVR [6,7]. Items with CVR value of 0.4 or above were considered acceptable [8]. For the CVI the same specialists were asked to assess the items based on a 4-point Likert scale of simplicity, relevancy, clarity and necessity. The CVI value of 0.79 or above was considered acceptable for each item [9].

To confirm reliability of the questionnaire, the data were completed by 15 students and the calculated a-coefficient was above 0.7 that was acceptable. In addition the 2-week interval test re-test analysis showed acceptable reliability of the questionnaire.

According to this validation we obtained a questionnaire including 7 items for knowledge, 6 items for perceived susceptibility, 7 items for perceived severity, 5 items for perceived benefit, 6 items for perceived barrier and 5 items for self efficacy. Therefore, responses to seven items related to knowledge regarding HIV/AIDS were aggregated and the mean

score was calculated. Except for knowledge questions, other response options were arranged on was categorized into numerical scores for the analysis.

Thus, the range of knowledge score was considered between 2 to 14. The ranges scores of perceived susceptibility were from 6 to 30. The scores for perceived severity ranged from 7 to 35. Perceived benefit scores ranged from 5 to 25 and for perceived barriers it ranged between 6 to 30. For self-efficacy this score ranged from 5 to 25.

Based on primary need assessment and literature review, an educational package was designed to improve HIV/AIDS knowledge through lecture, and HIV/AIDS perception based on HBM constructs through group discussion and problem solving. This education program was implemented during two 90-minute sessions for each group consisting 12-14 students. The content of educational program was regarding perceived susceptibility, severity, benefit, barrier and self efficacy about HIV/AIDS preventive behavior. This educational package was just provided for students in intervention school. The students in control group were not received any education.

The data based on the HBM questionnaire were collected two months after intervention and entered into the SPSS. Descriptive and analytical statistics were done to analyze data.

Ethical clearance was obtained from Tarbiat Modares University. Permission Was obtained from both high school managers and then consent form were Signed by all the study participants.

## Results

Totally 149 students, studying in first, second and third grades of high school, including 77 students with mean age of  $15.49 \pm 0.91$  in intervention group and 72 students with mean age of  $15.65 \pm 0.99$  in control group entered into the study and completed the questionnaires ( $p < 0.31$ ). The range of the participants' age was between 14 to 17 years old. All demographic characteristics of the participants were shown in Table 1. According to this Table, two groups were the same in terms of all

demographic data except for fathers' education ( $p < 0.001$ ), mothers' education ( $p < 0.001$ ) and mothers' occupation ( $p = 0.029$ ). Table 2 shows the mean scores of all HBM constructs before and after intervention in both groups of intervention and control groups. As results of this Table, there were no differences between two groups based on these constructs at initial of the study ( $p > 0.05$ ). After intervention, at 2-month follow up points all mean scores of HBM constructs of students in intervention group were improved significantly ( $p < 0.001$ ).

## Discussion

In this study the perception of HIV prevention among Iranian female high school students based on health belief model was assessed. According to the findings of this study, the majority of students thought that they were knowledgeable regarding HIV prevention behaviors. Despite this result, more than half of the participants did not consider themselves susceptible to HIV infection. It indicates that being highly knowledgeable regarding the disease prevention was not associated with highly perceive susceptibility to HIV infection. This result indicates educational interventions which cause students to feel themselves at risk of the infection are needed.

The previous study noted that AIDS-related knowledge does not necessarily translate into behavior modification, so attitude improvement is necessary for behavior change among Iranian students [10].

This study showed the perceived susceptibility of the participants who had been educated were significantly better than the other groups. This result is consistent with the previous research in Iran [11]. According to the mentioned study's result, the mean score of perceived severity was near average and the studied student had low perception due to perceived susceptibility. However the educational program could improve this variable significantly. The previous study also indicated the perceived severity could improve through educational program [12]. Although this study indicated that more than half of the students perceived the benefit of

**Table1** Comparison of demographic characteristics of two studied at initial of the study

	Intervention (N=77) N (%)	Control (N=72) N (%)	p-value
Participants' education			
Grade 1 (high school)	25(45.4)	24(33.3)	0.146
Grade 2 (high school)	22(28.6)	24(33.3)	
Grade 3 (high school)	20(26)	24(33.3)	
Participants' fathers education			
≥ 12 years	37(48)	5(7)	<0.001
< 12 years	40(52)	67(93)	
Participants' mothers education			
≥ 12 years	32(41.6)	9(12.6)	<0.001
< 12 years	45(58.4)	83(87.4)	
Participants' fathers occupation			
Occupied	73(94.8)	70(97.2)	0.562
Non occupied	4(5.2)	2(2.8)	
Participants' mothers occupation			
Occupied	7(9.1)	16(22.2)	0.029
Non occupied	70(90.9)	56(77.8)	
Participants' AIDS education			
yes	30(39)	29(40.3)	0.796
No	47(61)	43(59.7)	

HIV preventive behaviors. However there were near fifty percent of the participants who did not perceived these benefits. Therefore, health care providers and mass media should disseminate the advantages of the HIV prevention among students. However health educational program could improve perceived benefit of HIV among students in intervention group. This finding is in the line of previous study that was conducted among female students in Iran [11].

Our study revealed more than half of the studied student's perceived low barriers regarding HIV preventive behaviors. However the students

in intervention group who received the educational program felt lower barriers after intervention in comparison with other group that is consistent with previous research [12]. In present study the majority of the students reported they were confident regarding accomplishing preventive behaviors. This finding may be the reason for not doing risky behavior by studied students. However the self efficacy of the studied students in intervention group were increased significantly in comparison with other group. This result is in the line of previous research [13].

**Table 2** Comparison of two studied groups before and after intervention

	Intervention (N=77) M ± SD		p-value** before intervention	Control (N=72) M ± SD		p-value** after intervention
	Before intervention	After intervention		Before intervention	After intervention	
Knowledge	10.32±1.93	12.90±1.33	0.49	10.11±1.84	10.16±1.85	<0.001
p-value*	<0.001			0.78		
Perceived susceptibility	19.32±3.8	21.7±4.29	0.13	18.43±3.45	17.87±4.32	<0.001
Paired t-test	<0.001			0.23		
Perceived severity	21.98±4.7	25.48±5.45	0.64	21.63±4.37	20.6±4.42	<0.001
p-value*	<0.001			0.06		
Perceived benefit	19.23±4.04	22.18±2.90	26;0	19.93±3.47	18.44±3.86	<0.001
p-value*	<0.001			0.41		
Perceived barrier	21.48±4.03	20.12±3.16	0.78	21.3±3.82	18.08±3.46	<0.001
p-value*	0.019			<0.001		
Perceived self efficacy	20.31±3.66	21.87±3.61	0.77	20.48±3.82	19.81±13.90	<0.001
p-value*	<0.002			0.26		

\* Paired t-test

\*\*Independent t-test

In spite of strong points of present study, there were some weakness points should be mentioned. In our study the data collection was through self reporting by the participants that might be incorrect. Furthermore there was a small sample size that would confound the results. In addition, the results of this study could generalize to female students. Therefore, doing more researches without these limitations and with longer follow up, in future are recommended.

### Conclusion

This study showed the educational program could improve perceived susceptibility,

severity, benefit, barrier and self-efficacy of female high school students.

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### Contribution

Study design: SST

Conducting the research, Data Collection and

Analysis: KHS

Manuscript Preparation: SST

### Conflict of Interest

"The authors declare that they have no competing interests."

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